

MISCELLANEOUS.

Classification of the Foraminifera. By A. E. REUSS.

PROF. DR. A. E. REUSS, of Prague, who has studied the Foraminifera, especially as occurring in the fossil state, for many years, has lately offered the following systematic arrangement of the class to the Imperial Academy of Vienna. Dr. Reuss observes that a system based exclusively on one isolated character can never be expected to be a faithful interpretation of *natural* relationship. This can be rendered visible only by regarding as much as possible the total sum of characters,—placing, of course, in the first rank the most important and general among them.

The *chemical constitution* of the shell, as yet scarcely attended to, is among these characteristics. A considerable number of the genera of Foraminifera have arenaceo-siliceous shells—a character that may be of use in characterizing not only genera, but even whole families. Another character worthy of consideration in a systematic arrangement is the *intimate structure* of the shell,—the more so as it depends on the secretory powers of the animal, and perhaps also on its bodily organization. The mode in which the *concamerations* are disposed, in double, alternating, straight, or spiral series, is too liable to variation to be made the groundwork of systematic arrangement, as it is in the systems hitherto adopted.

Even the future value of the division into Monomeric and Polymeric Foraminifera may be a subject of doubt. The first of these divisions is subdivided into seven families:—*Gromideæ*, *Lagenideæ*, *Spirillinideæ*, *Squamulinideæ*, *Oculinideæ*, *Cornucopideæ*, and *Ammodiscideæ*. The second division comprises fourteen families:—*Rhabdoideæ*, *Cristellarideæ*, *Polymorphinideæ*, *Cryptostegia*, *Textularideæ*, *Cassidulinideæ* (these six have calcareous, vitreous shells, pierced with delicate pores), *Miliolideæ*, *Orbitulitideæ*, *Peneroplideæ* (these three have compact, calcareous, porcelain-like shells), *Lituolideæ*, *Uvellideæ* (these two have arenaceo-siliceous shells), *Rotalideæ* (with calcareous shells, intersected by ramified channels of various diameters), *Polystomellideæ*, and *Nummulitideæ* (these two have calcareous shells, intersected by ramified channels, and so represent, at least as regards the shell-structure, the highest type of organization within the class of *Foraminifera*).

On the Symmetry of the Echinodermata.

A memoir, in which M. Sars establishes the genus *Echinocumis* for a Holothuria found in the vicinity of Bergen, at a depth of 40 to 100 fathoms, is followed by some interesting considerations upon the symmetry of the Holothurida, of which the following is a *résumé*.

The celebrated investigations of Johannes Müller have proved that all larvæ of Echinoderms have a bilateral symmetry, and that the adult Echinoderms, although possessing a radiate symmetry, never-